# The High Prevalence of Knee Osteoarthritis in North China Population: The Handan Osteoarthritis Study

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*Abstract:*

*Objective: To investigate the prevalence of Handan city urban and rural elderly population in osteoarthritis and to discusses its characteristics and risk factors for disease*

*Methods: One neighborhood committees and two suburban counties are randomly selected. To draw to the r (village) committee that all residents over the age of 45 epidemiological investigation, questionnaire survey knee joint disease situation, college visits and physical examination and X-ray fluoroscopy.*

*Results: The total prevalence rate of knee osteoarthritis is 9.1%, the prevalence of 9.6% rural residents 9.6% of urban residents; Unreasonable 11.8% 5.9% of men women, gender, age, body mass index(BMI), urban and rural residents is not reasonable way of life and work associated with knee osteoarthritis.*

*Conclusion: Gender, age, body mass index, urban and way of life and work of rural residents are risk factors of knee osteoarthritis, should actively intervene to reduce the pathogenic effects of such factors.*

*Keywords:  Knee; Osteoarthritis; Body mass index; Epidemiology.*

## Introduction

Osteoarthritis (OA) is a degenerative joint disease in middle-aged and old people. The main characteristics of this chronic joint disease are the articular cartilage degeneration, damage, bone hyperplasia, pain and deformity. The susceptible factors of knee OA are various, including genetic, strain, metabolism, lifestyle, nutrition and other aspects. There are regional differences for the incidence of OA.[1-4]

It was related to the regional race, lifestyle, eating, working style, way of walking and obesity. Obesity is a risk factor for osteoarthritis, losing weight can reduce the risk of knee OA in women.[5] The data of the Chinese center for disease control and prevention showed that the obesity rate is significantly higher than the south in northern China. The chronic disease and its risk factors monitoring data according to a reported that obesity rate in Hebei region is significantly higher than the national average. Handan city is relatively dense and numerous population in Hebei province. To carry out the investigation of the relationship between obesity and joint is very necessary. With the growing elderly population, joint degeneration caused by osteoarthritis patients will also increase. Especially, as part

of the human body movement of the knee OA will be more and more obviously, it affects the quality of life for the elderly and the impact on the family and society cannot be ignored. Handan city is a relatively dense and numerous population in Hebei region, there is lack of epidemiological studies in knee OA. To investigate and explore the risk factors and the relationship between various factors and the related policy, health guidance, prevention and treatment decisions reference meaning is self-evident. Therefore, this research was carried out to investigate the epidemiological characteristics of knee OA in Handan region, and to explore the correlation between body weight and knee arthritis.

## Materials and methods

One residents' committee and 2 village committee were randomly selected in Handan city urban and suburban area. Residents aged 45, history of chronic kidney disease, rheumatoid arthritis, with no history of serious joint trauma or congenital malformations were investigated.

Knee osteoarthritis questionnaires designed by the orthopaedic follow health physical examination and imaging professionals, jointly participate in surveys and field questionnaire records, record (1) demographic information:

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name, sex, age, weight, height, etc;(2) the sociological materials: economy, eating habits, living environment condition, profession, profession position (squat), professional strength; Local symptoms and signs of knee joint (3) : unilateral or bilateral, pain time, varus or valgus deformity;(4) make a diagnosis and give treatment: X-ray films of a load-bearing status, orthopedic surgeons, and image practitioner for its diagnosis, analgesic drugs or not, articular cavity injection drug or not, joint replacement surgery or not.(5) the subjects divided into clinical symptoms and no clinical symptoms group. With clinical symptoms and the internal and external double deformities, to be a medical car load X-ray films of knee joint is oblique, and diagnosis.

Diagnostic criteria based on Kellgem classification: 0 level is normal, no osteophyte; Mild osteophyte, level I and level II, osteophyte, level III, but not involving the joint clearance joint clearance moderate stenosis, level IV joint space narrow obviously, subchondral sclerosis. For there are clinical symptoms and radiology X-ray showed Kellgem classification for class II or higher, diagnosis and exclusion of secondary osteoarthritis.

Specialist is responsible for the investigation information input computer, with SPSS 13.0 statistical processing.

1. Use rate than chi-square analysis of age, sex, Body mass index, Body mass index, BMI), professional position, living environment, living habits and so on in the normal group, or the difference of OA group, carries on the statistical description.
2. OA related factors by using Logistic regression analysis, P < 0.05 for statistical significance.

## Result

The survey sample of 1086 people, 1012 valid questionnaires, Rural city of 427 people, 585 people; Male 489, female 533 people; Age 42-82;Osteoarthritis, 92, 41 people, city 51 people in rural areas;29 men, women and 63.Knee osteoarthritis prevalence 2.1 9.1%, the unilateral knee joint OA incidence 7.9%, bilateral knee joint OA incidence of 1.2%;9.6% 9.6% prevalence of urban and rural areas, urban and rural; Incidence of knee OA gender: male 5.9%, female 11.8% ( Table 1).

According to the survey, this study is less than 70 years old crowd of knee OA incidence increased with age, the onset of the main crowd of 50 -70 years (table 2); part of the survey after knee replacement, more than 70 years old subjects because the daily activities, less with other diseases and refused surgery causes higher percentage of surgery. Gender prevalence differences respectively, women is 2.0 times that of the male incidence of knee OA (chi-square = 16.71, the degrees of freedom is 1, P = 0.000).No difference between the urban and rural distribution. Long engaged in farming, rural vocational distribution squat building work the crowd incidence is higher than the rest of the population, occupational distribution between urban and rural areas in long standing people than the rest of the population. Knee joint OA incidence increased with the increase of body mass index (BMI) of those surveyed (chi-square = 8.49.71, degrees of freedom is 1, P = 0.026).Number of overweight women than men.

**Table 1: The incidence of knee OA**

| Side don't prevalence (%) | | Gender incidence rate (%) | | Urban and rural rates (%) | |
|---|---|---|---|---|---|
| One sided | both sides | Men | Women | The city | The rura |
| 7.9% | 1.2% | 5.9 | 11.8% | 9.6% | 8.7% |

**Table 2: The age distribution of knee OA**

| Age group (years old) | n | Number of cases OA | Prevalence rate (%) |
|---|---|---|---|
| 40～49 | 186 | 5 | 2.7 |
| 50～59 | 367 | 25 | 6.8 |
| 60～69 | 382 | 43 | 11.3 |
| 70～ | 77 | 19 | 24.7 |
| Total | 1012 | 92 | 9.1 |

The gender, age, body mass index, job position (farming, crouch long) as variable to establish multivariate regression equation, the multi-factor Logisitic regression was analyzed

(table 3). The higher body mass index, age, long-term farming and long crouching, women are the dangerous factors of knee OA.

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**Table 3: The region's knee osteoarthritis joint Logistic regression analysis of related factors**

| | variable | Bvalue | OR value (95% CI) | P |
|---|---|---|---|---|
| The knee OA | Gender | 0.934 | 2.489 | 0.000 |
| | Age | 0.058 | 1.061 | 0.000 |
| | Body mass index (BMI) | 0,087 | 1.071 | 0.014 |
| | Working posture | 0.021 | 1.023 | 0.026 |

## Discussion

The epidemiological survey results show that the incidence of knee OA female than for male, the overall incidence of 9.1%, compared with other studies in a high level. Have reported incidence of knee OA was 9.6%.[6] It may be related to geographical, way of working and eating habits. With the continuous development of urban and rural economy, the continuous improvement of diet and nutrition, obesity increased gradually, obesity as one of the important risk factors for knee OA should attach importance to it. Strengthen the intervention and guidance is necessary for the prevention of knee OA. As the ceaseless improvement of the quality of life in urban and rural areas, the average life expectancy growing continuously extend, obese, knee joint OA may increase year by year. Diet intervention, weight control, convenient living and working way and community health education are imperative to improve the level of regional and the quality of life.

The study found that the region's residents high-risk dangerous factors of knee OA to a higher body mass index (BMI) and the way the farming and crouch long work. With the development of modern agriculture mechanization, rural residents for agricultural factors lead to severe osteoarthritis will be weakened. However, crouch long assignments in the number of construction workers are still more, and the knee joint injury factors still exist. High incidence of female residents may be associated with women unique physiological characteristics. The incidence of female postmenopausal patients with osteoarthritis rise rapidly, remove the age factor, elevatory and postmenopausal estrogen and progesterone levels and an imbalance of the both in the body. Many studies were carried out the related research.[7,8] In addition, the survey found that the knee OA incidence in women was significantly higher than male. High women than men are in with a BMI may be one of the reasons, but not the only reason.[9] Furthermore, this study found that the higher incidence of knee OA in older people, but the relatively small number of patients (Table 2). Reasons may be various, may be associated to the survey sample, some personnel lost to follow-up, decrease of activity in older patients and deaths for other diseases.

In conclusion, Gender, age, body mass index, urban and way of life and work of rural residents are risk factors of knee osteoarthritis. Gender and age factors cannot control. Health management should induce local residents to have a reasonable diet, to avoid obesity, to control weight in the reasonable scope and to guide the right style of life and work habits.

## Conflict of interest

None declared.

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